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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,436	03/26/2004	Steven T. Fink	250975US6 YA	8103

22850 7590 04/27/2007
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

ZERVIGON, RUDY

ART UNIT	PAPER NUMBER
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1763

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/27/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/27/2007.

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patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No. 10/809,436	Applicant(s) FINK, STEVEN T.	
	Examiner Rudy Zervigon	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 February 2007 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “an *adapter* for connecting to a cooling system” (claim 7), “first segment”, “second segment”, “plasma adapter”, “substrate holder ring” must be shown or the feature canceled from the claims. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 14-16, 18, and 19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant's claimed "first segment", "second segment", "plasma adapter", "substrate holder ring" are nowhere discussed in the application as filed.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 13-15, and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 requires "a leak check port positioned between said vacuum seal and said dielectric seal", as claimed by claim 13. However claim 12 requires only the alternative – "wherein said at least one seal comprises a vacuum seal and a dielectric seal". As a result, claim 12 only requires one seal of type vacuum or of type dielectric, *not two seals as required by claim 13*.

Claim 14 requires "a second segment extending substantially perpendicular to the first segment and being configured to contact a focus ring", is it the first segment or the second segment that is "configured to contact a focus ring"?

6. Claim 19 recites the limitation "said substrate holder ring". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 2-9, and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Moslehi; Mehrdad M. et al. (US 6073576 A). Moslehi teaches a temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) for shielding a substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4) in a semiconductor processing system (Figure 6), the temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) comprising: a cap (398; Figure 10; 62; Figure 2; column 14, line 63; column 7, lines 48-63) having a coolant passage (400; Figure 10; column 14, line 54 - column 15, line 4) therein; a plenum adaptor (370; Figure 10; column 14, line 60) coupled to the cap (398; Figure 10; 62; Figure 2; column 14, line 63; column 7, lines 48-63) and configured to connect to a coolant system (372; Figure 10; column 14, line 55) for circulating coolant to the coolant passage (400; Figure 10; column 14, line 54 - column 15, line 4), the plenum adaptor (370; Figure 10; column 14, line 60) having a plenum adapter ring (piece immediately below 370, atop 380; Figure 10) configured to be supported by a substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4), as claimed by claim 9

Moslehi further teaches:

- i. The temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) according to claim 9, wherein the shield ring (398+370+400; Figure

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- 10; column 14, line 54 - column 15, line 4) comprises: a cap (398; Figure 10; 62; Figure 2; column 14, line 63; column 7, lines 48-63); and a heat conducting element (386; Figure 10; column 14, line 54 - column 15, line 4) connected between the cap (398; Figure 10; 62; Figure 2; column 14, line 63; column 7, lines 48-63) and a location where a substrate would rest during processing, the heat conducting element (386; Figure 10; column 14, line 54 - column 15, line 4) configured to transfer heat from the substrate to the cap (398; Figure 10; 62; Figure 2; column 14, line 63; column 7, lines 48-63), as claimed by claim 2
- ii. The temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) according to claim 2, wherein the cap (398; Figure 10; 62; Figure 2; column 14, line 63; column 7, lines 48-63) comprises a ceramic material (“aluminum oxide”; column 7, lines 48-63), as claimed by claim 3
- iii. The temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) according to claim 2, wherein the cap (398; Figure 10; 62; Figure 2; column 14, line 63; column 7, lines 48-63) comprises anodized aluminum (“aluminum oxide”; column 7, lines 48-63), as claimed by claim 4
- iv. The temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) according to claim 9, wherein the coolant comprises a dielectric fluid, as claimed by claim 5. Applicant’s claim requirement of “wherein the coolant comprises a dielectric fluid” is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at

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769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

- v. The temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) according to claim 9, further comprising an insulator (bolted piece surrounding 398; Figure 10) housed between the shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) and the substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4), as claimed by claim 6
- vi. The temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) according to claim 9, further comprising an *adapter* (connections, not shown, for 372; Figure 10; column 14, line 55) for connecting to a cooling system (372; Figure 10; column 14, line 55) of the substrate to provide coolant exchange between the shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) and the substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4), as claimed by claim 7
- vii. The temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) according to claim 9, wherein the shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) is configured to attach to the substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4) without the use of fasteners, as

claimed by claim 8. Applicant's claim requirement of "configured to attach to the substrate holder without the use of fasteners" is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

- viii. The temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) of claim 9, further comprising an insulating member ("L" piece adjacent to 370; Figure 10) adjacent to the first segment (386/398 interface) and configured to thermally insulate the shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) from a substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4) when the shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) is coupled to a substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4), as claimed by claim 16
- ix. A substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4) assembly comprising: a temperature-controlled substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4) having a first surface (356; Figure 10; column 14, line 55) configured to support a semiconductor substrate, and a second surface (accommodating 388; Figure

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10; column 14, lines 55-65) surrounding a perimeter of the first surface (356; Figure 10; column 14, line 55) and configured to support a shield ring (388; Figure 10; column 14, line 54 - column 15, line 4); and a temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) coupled to said second surface (accommodating 388; Figure 10; column 14, lines 55-65) and having at least one coolant passage (400; Figure 10; column 14, line 54 - column 15, line 4) provided within the temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4), as claimed by claim 17

- x. The substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4) assembly of claim 17, wherein the temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) comprises a cap (398; Figure 10; 62; Figure 2; column 14, line 63; column 7, lines 48-63) having the at least one coolant passage (400; Figure 10; column 14, line 54 - column 15, line 4) therein, and a plasma adapter (connections, not shown, for 372; Figure 10; column 14, line 55) coupled to the cap (398; Figure 10; 62; Figure 2; column 14, line 63; column 7, lines 48-63) and configured to connect to a coolant system (372; Figure 10; column 14, line 55) for circulating coolant to the coolant passage (400; Figure 10; column 14, line 54 - column 15, line 4), as claimed by claim 18

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 10-15, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi; Mehrdad M. et al. (US 6073576 A) in view of Nagaiwa, Toshifumi et al. (US 20020029745 A1). Moslehi is discussed above. Moslehi does not teach:

- i. The temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) of claim 9, wherein the cap (398; Figure 10; 62; Figure 2; column 14, line 63; column 7, lines 48-63) is coupled to the plenum adapter (connections, not shown, for 372; Figure 10; column 14, line 55) by at least one annular nut, as claimed by claim 10
- ii. The temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) of claim 9, further comprising at least one seal interposed between the cap (398; Figure 10; 62; Figure 2; column 14, line 63; column 7, lines 48-63) and the plenum adapter (connections, not shown, for 372; Figure 10; column 14, line 55), said seal being configured to impede and escape of said coolant from the coolant passage (400; Figure 10; column 14, line 54 - column 15, line 4), as claimed by claim 11
- iii. The temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) of claim 11 wherein said at least one seal comprises a vacuum seal and a dielectric seal, as claimed by claim 12
- iv. The temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) of claim 12, further comprising a leak check port positioned between said vacuum seal and said dielectric seal, as claimed by claim 13.

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- v. The temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) of claim 9, further comprising a heat conducting element (386; Figure 10; column 14, line 54 - column 15, line 4) comprising: a first segment (386/398 interface) extending along and in contact with said cap (398; Figure 10; 62; Figure 2; column 14, line 63; column 7, lines 48-63), and a second segment extending substantially perpendicular to the first segment (386/398 interface) and being configured to contact a focus ring surface and a substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4) surface when the shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) is coupled to a substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4) assembly, as claimed by claim 14
- vi. The temperature-controlled shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4) of claim 14, wherein said second segment includes a protrusion extending substantially perpendicular from the second segment so as to provide a discrete surface for contacting the substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4) surface, as claimed by claim 15
- vii. The substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4) assembly of claim 18, further comprising a focus ring coupled to said substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4) and interposed between a perimeter of said substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4) ring; and a heat conducting element (386; Figure 10; column 14, line 54 - column 15, line 4) comprising a first segment (386/398 interface) extending along and in contact with said cap (398; Figure 10; 62; Figure 2; column 14, line 63; column 7, lines 48-63) and a second segment

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extending substantially perpendicular from the first segment (386/398 interface) and contacting said focus ring and said substrate holder (380; Figure 10; column 14, line 54 - column 15, line 4), wherein the heat conducting element (386; Figure 10; column 14, line 54 - column 15, line 4) provides a heat conduction path from said substrate, through said focus ring, to the shield ring (398+370+400; Figure 10; column 14, line 54 - column 15, line 4), as claimed by claim 19

Nagaiwa teaches a wafer processing system (Figure 1) including:

- i. Nagaiwa's temperature-controlled shield ring (50; Figure 8) of claim 9, wherein Nagaiwa's cap (55; Figure 8) is coupled to Nagaiwa's plenum adapter (51; Figure 8) by at least one annular nut (accommodating 56a; Figure 8), as claimed by claim 10
- ii. Nagaiwa's temperature-controlled shield ring (50; Figure 8) of claim 9, further comprising at least one seal (51E; Figure 8) interposed between Nagaiwa's cap (55; Figure 8) and Nagaiwa's plenum adapter (51; Figure 8), Nagaiwa's seal (51E; Figure 8) being configured to impede and escape of Nagaiwa's coolant from Nagaiwa's coolant passage (51D; Figure 8), as claimed by claim 11
- iii. Nagaiwa's temperature-controlled shield ring (50; Figure 8) of claim 11 wherein Nagaiwa's at least one seal (51E; Figure 8) comprises a dielectric seal (51E; Figure 8) – claim 12
- iv. Nagaiwa's temperature-controlled shield ring (50; Figure 8) of claim 9, further comprising a heat conducting element (64; Figure 8) comprising: a first segment (vertical piece of 64; Figure 8) extending along and in contact with Nagaiwa's cap (55; Figure 8), and a second segment (horizontal piece of 64; Figure 8) extending substantially

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- perpendicular to Nagaiwa's first segment (vertical piece of 64; Figure 8) and being configured to contact a focus ring (52; Figure 8; [0090]) surface and a substrate holder (piece below 51; Figure 8) surface when Nagaiwa's shield ring (50; Figure 8) is coupled to a substrate holder (piece below 51; Figure 8) assembly, as claimed by claim 14
- v. Nagaiwa's temperature-controlled shield ring (50; Figure 8) of claim 14, wherein Nagaiwa's second segment (horizontal piece of 64; Figure 8) includes a protrusion extending substantially perpendicular from Nagaiwa's second segment (horizontal piece of 64; Figure 8) so as to provide a discrete surface for contacting Nagaiwa's substrate holder (piece below 51; Figure 8) surface, as claimed by claim 15
- vi. Nagaiwa's substrate holder (piece below 51; Figure 8) assembly of claim 18, further comprising a focus ring (52; Figure 8; [0090]) coupled to Nagaiwa's substrate holder (piece below 51; Figure 8) and interposed between a perimeter of Nagaiwa's substrate holder (piece below 51; Figure 8) ring; and a heat conducting element (64; Figure 8) comprising a first segment (vertical piece of 64; Figure 8) extending along and in contact with Nagaiwa's cap (55; Figure 8) and a second segment (horizontal piece of 64; Figure 8) extending substantially perpendicular from Nagaiwa's first segment (vertical piece of 64; Figure 8) and contacting Nagaiwa's focus ring (52; Figure 8; [0090]) and Nagaiwa's substrate holder (piece below 51; Figure 8), wherein Nagaiwa's heat conducting element (64; Figure 8) provides a heat conduction path from Nagaiwa's substrate, through Nagaiwa's focus ring (52; Figure 8; [0090]), to Nagaiwa's shield ring (50; Figure 8), as claimed by claim 19

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Nagaiwa's temperature-controlled shield ring (50; Figure 8) elements and add an additional fluid port used as a leak check port.

Motivation to add Nagaiwa's temperature-controlled shield ring (50; Figure 8) elements and add an additional fluid port used as a leak check port is for attenuating temperature increases near the edge of wafers thus influencing the yield of the processed devices ([0008]). It is well established that the duplication of parts is obvious (In re Harza , 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04).

Response to Arguments

11. Applicant's arguments with respect to claims 2-19 have been considered but are moot in view of the new grounds of rejection.

Conclusion

12. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.

A handwritten signature in black ink, appearing to read 'Rudy Zervigon', with a date '4/27/17' written below it.